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ABSTRACT

This report presents data from the second year of a multiyear study designed to evaluate student performance in terms of measures related to the statewide goals for education in Kentucky's schools and then to determine the relationship between school system characteristics and the quality of student performance. Student performance was analyzed for the six goal areas of 1) general education, 2) occupational competence, 3) human relationships, 4) citizenship, 5) cultural appreciation, and 6) creative, constructive, and cultural thinking. All the public school districts that chose to participate in the Kentucky Educational Assessment Program were selected for the study, including 109 districts for which fourth-grade general education data were available, 92 districts for which eighth-grade data on all six measures were available, and 86 districts for which eleventh-grade data on all six measures were available. Performance data for each goal area and school district were analyzed and used to determine which characteristics differentiated the top 30 districts from the bottom 30 districts. (Author/JG)

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KENTUCKY QUALITY EDUCATION STUDY: 1974-75

Technical Report

Prepared by
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EA 009 859

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March, 1977

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INTRODUCTION

The Kentucky Quality Education Study was undertaken by the State Department of Education in November of 1974. The objective was to conduct "a major study to identify characteristics of school systems as related to quality education and the required cost of providing these characteristics as well as the source of such support."

The first problem in beginning a project of this nature was to define the term "quality education." In 1973, the Kentucky State Board of Education approved eight goals for education in Kentucky's schools (Goals of Education in Kentucky, Kentucky State Department of Education, October, 1973.) The eight goals were: (1) General Education, (2) Economic Understanding, (3) Human Relationships, (4) Citizenship, (5) Creative, Constructive, and Critical Thinking, (6) Physical and Mental Well Being, (7) Occupational Competence, and (8) Cultural Appreciation. These goals along with subgoals are listed in Appendix A. For purposes of this study, the term "quality education" has been defined as the level of student attainment in each of these eight goals.

Measuring student performance in each of the goals was the second major difficulty encountered. In looking for objective measures of student performance, it was found that the State Department of Education had access to such measures state-wide in only two goals, General Education and Occupational Competence. Therefore, a large portion of the time allocated to this study has been spent developing objective measures of student performance in the remaining six goal areas. The result of this effort has been the development of the Kentucky Quality Education Questionnaire (KQEQ), a student questionnaire designed to measure four additional goal areas: (1) Human Relationships, (2) Citizenship, (3) Creative, Constructive, and Critical Thinking, and (4) Cultural Appreciation. Thus, the 1974-75 report includes an analysis of student performance in all but two goal areas, Economic Understanding and Physical and Mental Well Being. The first report covering the 1973-74 school year was limited to only one goal area, General Education, because of the limitations on available student data. Present plans call for the inclusion into the KQEQ measures of the remaining two goals within the next two years.

In certain of the remaining sections of this report, the content includes discussion which is oriented toward the technical and statistical dimensions of the Quality Education Study. However, in order to make the results reported in this study useful to the non-statistically oriented reader, technically oriented discussion has been minimized in the sections "Summary of Proposed Quality Education Research Project" and "Summary and Conclusions." The remaining sections include the statistical results on which the conclusions are based.

SUMMARY OF THE PROPOSED
QUALITY EDUCATION RESEARCH PROJECT

The Proposed Quality Education Research Project was approved in November of 1974 at which point the staff of the State Department of Education began implementing the work plan. Basically, the research design advocated in the work plan consisted of two phases or types of data analysis. The first phase of the data analysis was to consist of relating measures of student performance in each individual goal area to specified sets of variables thought to be characteristics which influence student performance. The statistical methodology to be used in this phase was that of stepwise multiple regression. This strategy of data analysis is useful in determining existing relationships between the characteristics of a school system and the quality of student performance in a particular goal area. For example, one might find that the percent of students in average daily attendance is strongly related to the level of student achievement in the goal area of General Education.

The objective of the second phase of data analysis was to determine the way in which characteristics of school systems vary in districts where students perform well in all of the eight goal areas as opposed to the characteristics of school systems where the students perform relatively poorly in all eight goal areas. Before such an analysis could be run, some method of determining the relative strength or weakness in a school district taking all eight goals into consideration had to be devised. For this reason, what will be referred to as a "quality ranking" has been calculated for each school system included in this study. This was done by averaging the mean level of performance of a given district in each of the goal areas on which data were available for the 1974-75 school year. These scores were then ranked from high to low. Multiple stepwise discriminate analysis was then used to determine which characteristics discriminated the top thirty ranking districts from the bottom thirty ranking districts.

Due to the fact that adequate measures of student performance were available in only two goal areas when the Quality Education Project was first undertaken, it was necessary to either develop new instrumentation for the remaining six goal areas or adopt existing instrumentation. The cost of the second of these alternatives was at the time prohibitive. An equally important factor in ruling out the second alternative was the lack of appropriate instruments geared to measuring student performance in each of the remaining goals. Therefore, a strategy for developing new instrumentation was included in the work plan. (This will be discussed in greater detail in the next section.) As has been previously mentioned, this effort has resulted in adequate measures of student performance in all but two goal areas. Thus, the "quality rankings" referred to in reference to the 1974-75 school year do not take into consideration measures of Economic Understanding or Physical and Mental Well Being.

All of the local school districts on which test scores were available for the 1974-75 school year have been included in this study. However, it is important to stress that individual district's test scores are not being published in this study. The intent of this report is to provide educators across the Commonwealth an indication of which local district characteristics are related to student performance, and which characteristics distinguish high "quality ranking" districts from low "quality ranking" districts.

METHODOLOGY

Sample: Those local school districts which chose to participate in the Kentucky Educational Assessment Program were selected to be included in the study. All of the public school districts in the Commonwealth are invited each year to participate in the assessment program. Participation on a local district's part is strictly voluntary. At the fourth grade level, all districts for which there fourth grade general education (GEN ED) data were included in this study. (See the next section for definitions of terms and acronyms). At the eighth grade level, all districts for which there were general education (GEN ED), human relationships (HUM REL), citizenship (CITIZ), creative, constructive, and critical thinking (CCCT), occupational competence (OCU CMP), and cultural appreciation (CUL APP) measures were included. At the eleventh grade level, all districts for which there were GEN ED, HUM REL, CITIZ, CCCT, and CUL APP measures were included. The above criteria resulted in a sample of 109 fourth grade districts, a sample of 92 eighth grade districts, and a sample of 86 eleventh grade districts. In the analyses which will be described in the following, each of these samples was considered separately.

Constraints: The samples at these three grade levels are not strictly random in nature. It is conceivable that some bias exists due to the voluntary nature of the samples. Those school districts which have been listed in the following table were included in this study. The "X" in the column or columns following a district name indicates at which grade level or levels a district was included in a given sample. Again, emphasis should be placed on the confidential nature of the local district test scores. At no point in this report are individual local district scores discussed or released.

TABLE 1: LIST OF SCHOOL DISTRICTS INCLUDED IN FOURTH, EIGHTH, AND ELEVENTH GRADE SAMPLES

District	Grade			District	Grade			District	Grade		
	4	8	11		4	8	11		4	8	11
Adair Co.	X	X	X	Green Co.	X	X	X	Oldham Co.	X	X	X
Anchorage Ind.	X	X		Greenup Co.	X	X	X	Owen Co.	X	X	X
Ashland Ind.	X	X	X	Hancock Co.	X	X	X	Owsley Co.	X		X
Augusta Ind.	X	X	X	Hardin Co.	X		X	Paintsville Ind.	X	X	X
Ballard Co.	X	X	X	Harlan Co.	X	X	X	Paris Ind.		X	
Barbourville Ind.	X		X	Harrodsburg Ind.	X			Pendleton Ind.	X	X	X
Bardstown Ind.	X	X	X	Hart Co.	X	X		Perry Co.	X	X	X
Barren Co.	X	X	X	Hazard Ind.	X	X	X	Pike Co.	X		
Bell Co.	X	X	X	Henderson Ind.	X	X	X	Pikeville Ind.	X	X	X
Bellevue Ind.	X		X	Hickman Co.	X	X	X	Pineville Ind.	X	X	X
Berea Ind.			X	Hopkins Co.	X	X	X	Providence Ind.	X	X	X
Boone Co.	X	X	X	Jefferson Co.	X	X	X	Pulaski Co.	X		
Bourbon Co.	X	X		Jenkins Ind.	X	X	X	Raceland Ind.	X	X	
Boyd Co.	X	X	X	Jessamine Co.	X		X	Robertson Co.		X	X
Boyle Co.	X	X	X	Johnson Co.	X	X	X	Rowan Co.	X	X	X
Bracken Co.	X		X	Kenton Co.	X			Russell Ind.	X	X	X
Breckinridge Co.	X	X	X	Knott Co.	X	X		Science Hill Ind.	X		
Bullitt Co.	X	X		Knox Co.	X	X	X	Shelby Co.	X	X	X
Caldwell Co.	X	X	X	Lee Co.	X	X	X	Simpson Co.	X	X	X
Calloway Co.	X	X		Leslie Co.	X	X	X	Somerset Ind.	X	X	X
Campbell Co.	X			Lewis Co.	X	X		Spencer Co.	X	X	X
Campbellsville Ind.	X	X	X	Livingston Co.	X	X	X	Taylor Co.	X	X	X
Carlisle Co.	X	X	X	Logan Co.	X		X	Todd Co.	X	X	X
Caverna Ind.	X	X	X	Ludlow Ind.		X	X	Warren Co.	X		X
Christian Co.			X	Lynch Ind.	X	X	X	Washington Co.	X	X	
Clark Co.	X		X	Madison Co.		X	X	Wayne Co.	X	X	
Cloverport Ind.	X	X		Marshall Co.	X	X		Webster Co.	X		
Corbin Ind.	X	X	X	Mason Co.		X	X	West Point Ind.	X	X	
Covington Ind.	X			Mayfield Ind.	X	X	X	Williamsburg Ind.	X	X	
Crittenden Co.	X	X	X	Maysville Ind.	X	X	X	Woodford Co.	X	X	
Dayton Ind.	X	X	X	McCracken Co.	X	X	X				
Edmonson Co.	X	X		McCreary Co.	X		X				
Elizabethtown Ind.	X	X	X	Meade Co.	X						
Erlanger Ind.	X		X	Mercer Co.	X	X	X				
Fleming Co.	X	X		Metcalfe Co.		X					
Fort Thomas Ind.	X	X	X	Middlesboro Ind.	X	X	X				
Frankfort Ind.	X	X	X	Monroe Co.		X	X				
Franklin Co.	X	X		Montgomery Co.	X						
Fulton Co.	X	X	X	Monticello Ind.	X	X	X				
Fulton Ind.	X	X	X	Mt. Sterling Ind.	X						
Garrard Co.	X	X	X	Muhlenberg Co.	X	X	X				
Glasgow Ind.	X	X		Murray Ind.	X		X				
Grant Co.	X	X	X	Newport Ind.	X	X					
Grayson Co.	X	X	X	Nicholas Co.	X		X				

Analysis of Individual Goals: The purpose of this phase of the analysis was to relate student performance in the individual goals on which measures were available to selected school process and community input independent variables which are defined in the next section. The statistical methodology selected to accomplish this objective was that of multiple stepwise regression. The computations were accomplished through the use of a prepared computer program, BMD 0 2R.[1] The program in each analysis was left free to select each of the eighteen independent variables according to their importance in explaining the variation in student performance in a particular goal. The default values that are built into the program were not altered. [2] Thus the computer selects from the defined list of independent variables those which account for the most variation in the criterion variable under consideration. On the first step of the analysis, this variable is placed in a regression equation. District Performance = -0.35. EC DEP + 70.5. On the second step, the independent variable which, in combination with the variable already in the equation, increases the multiple correlation the most is then added to the equation. This process is continued until none of the remaining independent variables contribute significantly to the process or until all independent variables are included.

Only one analysis was run at the fourth grade level since there was only one measure of student performance available, General Education. Six separate analyses were run on the eighth grade sample because adequate measures were available on all goals considered in this year's study. At the eleventh grade level, five separate analyses were run since there was no measure of Occupational Competence at this level.

Analysis of Quality Rankings: This phase of the analysis was not applied to the fourth grade sample. Quality rankings based on a single goal for which only a measure of General Education was available would have resulted in findings very similar to those which resulted from the earlier application of multiple stepwise regression.[3] In the second phase of the analysis, which was applied to the eighth and eleventh grade samples, stepwise discriminant analysis was the statistical methodology applied. The objective in this phase of the analysis was to first classify school districts into high achieving and low achieving groups based on the quality rankings, as defined in the next section, and second, to determine which of the independent variables were most influential in classifying a district into one of thes three groups. The computations in this phase of the analysis were also completed through the use of a prepared computer program, BMD 0 7M.[4]

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[1] W.J. Dixon (Ed.), BMD Biomedical Computer Programs, (Berkely, Calif: University of California Press, 1974), p. 305.

[2] F to enter = .01 F to delete = .005 Tolerance = .001

[3] Daniel J. Amick and Herbert J. Walberg, Introductory Multivariate Analyses, (Berkeley, Ca.: McCutchan Publishing Corporation, 1975), p. 240.

[4] Ibid, p. 233.

DEFINITION OF VARIABLES

The following is a list of the variables taken into consideration in this study. For each variable, there is a brief definition and a five to seven letter acronym which will be used to refer to these variables in later sections. The variables defined here are divided into three types: criterion variables, independent school process variables, and independent community variables. The criterion variables are those which measure student performance in the six goals for which instrumentation was available in April of 1975. The independent school process variables are those intended to measure those variables over which the local school district has some control. The independent community input variables are those over which the school is thought to have little or no influence. All data is from the school year 1974-75 except when noted in this section.

Criterion Variables

GEN ED: The criterion variable General Education is measured by the Comprehensive Test of Basic Skills, Form Q Levels 2, 3, and 4 which are administered to a sample of Kentucky's local school districts at the fourth, eighth, and eleventh grades respectively. At each grade level, participating districts were assigned a score equivalent to the mean raw scores of a sample of their students. These district scores were then converted to a standard T distribution (Mean = 50, Standard deviation = 10).

HUM REL: The Human Relationships data were gathered from a segment of the KQEQ which was administered in the spring of 1975 to a sample of school districts across the Commonwealth. District scores were assigned as being the mean raw score of a sample of each district's students. As was done with the CTBS scores, the HUM REL scores were converted to a standard T distribution (Mean = 50, Standard deviation = 10).

CITIZ: The Citizenship data were also obtained from a segment of the KQEQ. District scores were assigned and a standard T distribution was formed.

CCCT: The Creative, Constructive, and Critical Thinking data were also gathered from a segment of the KQEQ. District scores were assigned and a standard T distribution was formed as was done for Human Relationships.

OCU CMP: The Occupational Competence scores were taken from the "Occupational Characteristics" subtest of the Assessment of Career Development (ACD). As before, district scores were assigned, and a standard T distribution was developed.

CUL APP: The Cultural Appreciation data were obtained from the final segment of the KQEQ. District scores were assigned as was done for Human Relationships, and a standard T distribution was developed.

QLT RNK: The Quality Ranking was calculated for each participating district at the eighth and eleventh grades. At the eighth grade level, this include CTBS, HUM REL, CITIZ, CCCT, OCU CMP, and CUL APP. The eleventh grade Quality Rankings do not include OCU CMP scores due to the fact that the ACD was only administered at the eighth grade level during the school year under observation. Quality Rankings were not calculated for the fourth grade because measures were available in only one goal, General Education.

Independent School Process Variables

RANK 2: This refers to the percent of a local district's staff which is classified as Rank II or higher. These teachers must hold a standard teaching certificate and have completed at least a masters degree or an approved equivalent.

RANK 4: This refers to the percent of a local district's staff which is classified as Rank IV or lower. In general, this is an emergency classification for teachers not having completed a B.A. or B.S. degree at an approved college or university.

PUP TH: The pupil/teacher ratio was calculated by dividing the membership in a local district by the total number of classroom teachers.

PUP GD: The pupil/guidance counselor ratio was calculated by dividing the membership of a local district by the total number of guidance counselors (full time equivalencies).

TH EXP: Teacher experience was measured by calculating the mean number of years a district's classroom teachers had been employed in that district. Thus, it might also be considered a measure of teacher turn-over.

ATTEND: Percent of students in average daily attendance was determined by calculating the percent of total district membership in average daily attendance.

PUP AD: The pupil/administrative personnel ratio was calculated by dividing a local district's membership by its total administrative staff (full time equivalence). A district's total administrative staff was defined to include superintendents, assistant superintendents, principals, assistant principals, finance officers, school business administrators, school lunch directors, administrator of federal programs (or coordinator), school health coordinator, director of vocational trade school, (or assistant director), data processing, dean, director of transportation, rehabilitation coordinator, counselor, and teacher coordinators.

PUP PR: The pupil/principal ratio was calculated by dividing a district's student membership by the district's combined total of principals and assistant principals.

TH SUP: The teacher/instructional supervisor ratio was calculated by dividing a district's total number of classroom teachers by the district's instructional supervisors (full time equivalency). If a district had no instructional supervisors, it was given the highest ratio of those districts which did have instructional supervisors.

PRG UT: Program units refers to the number of program units offered at the high school level. It can be considered both as a measure of a district's size and as a measure of the diversity of a district's program.

PUP LIB: The pupil/librarian ratio was calculated by dividing the total number of librarians (full time equivalencies) into a district's total student membership.

EXPL: The expulsion rate refers to the percent of a district's student membership which was expelled in the 1974-75 school year. (It should be noted here that there are a number of community factors which influence the expulsion rate. However, this rate must also be influenced by a number of school policies (e.g. policy toward discipline, enforcement of rules, facilities for handling problem children, etc.).

Independent Community Input Variables

EC DEP: The percent of a district's students who are economically deprived was defined as the percent of that district's students eligible to receive benefits under Title I ESEA.

DELINQ: The juvenile delinquency rate was available only at the county level. There was no way to break out the independent districts from a county. Thus, an independent district was assumed to have the same rate as the surrounding county, and vice-versa. This rate was expressed as the number of referrals to the county juvenile court per one thousand students enrolled in school in the county. (These data are for calendar year 1974 as opposed to school year 1974-75. There are some problems with the manner in which this data was collected. Because of this, this data is not considered to be reliable. It was left in this year's study only because it was found to be a significantly important variable in last year's study.)

INCOME: Per capita income was also available on a county level. Thus, independent districts were again assumed to be the same as the surrounding county. The latest year for which this data was available at the time of this study was 1973.

DRP OTS: Drop out factor was measured by calculating the sixteen-year-olds not enrolled in school as a percentage of the district's student membership.

ADA: The average daily attendance was calculated by dividing a district's total attendance by the number of school days. This is not to be confused with the percent of students in average daily attendance (ATTEND). ADA can be considered a measure of a district's size.

HLD PWR: Holding Power, although it may seem similar, should not be confused with dropout. This reflects the percent of ninth graders of four years ago now graduating from high school. This percentage is affected by dropouts and it is also affected by in and out migration from a local district.

TEST CONSTRUCTION PHASE

The State Department of Education has access to CTBS Form Q Levels 2,3, and 4 which were administered to a sample of school districts across the state at the fourth, eighth, and eleventh grades respectively. This test in general covers reading, math, and language skills. For purposes of this study, CTBS total score has been considered an adequate measure of General Education. Scores from the Assessment of Career Development test were also available on a sample of school districts at the eighth grade level only. This was thought to be an adequate measure of Occupational Competence. Both of these tests are administered annually to a sample of Kentucky's school districts on a voluntary basis through the Kentucky Educational Assessment Program. Thus, there was no need to develop instrumentation for these two goals.

The instrumentation to measure the remaining six goal areas as described in the Proposed Quality Education Project was to be developed by applying a generally accepted strategy in building a standardized test. The process spelled out in the work plan and summarized here was to be applied to each of the six remaining goal areas. To date, the instrumentation has been completed for goal: (3) Human Relationships, (4) Citizenship, (5) Creative, Constructive, and Critical Thinking, and (8) Cultural Appreciation at the eighth and eleventh grade levels. Due to the nature of the items used in developing the KQEQ (the reading level, content, etc.), the decision was made to delay the development of instrumentation applicable to the fourth grade level until complete instrumentation has been developed at the eighth and eleventh grade levels. This will limit the analysis of fourth grade student performance in this study to the goal of General Education. Economic Understanding and Physical and Mental Well Being are in the early development stages.

The process used in developing instrumentation basically consisted of four steps: development of original item pool, pilot-testing of original items, field testing of original items, and final revision of item pools. The first step was to develop item pools relevant to each of the four goals for which instrumentation has been completed. It was necessary to review a number of previously published tests in search of items containing content relevant to any one of the previously mentioned four goals. As these items were found, they were adapted for inclusion in at least one of the four original item pools. After the completion of the four original item pools, validity of each pool of items needed to be established (that is, that the items measure the goal they were intended to measure).

The "content validity" of these items was established through a review process carried out in the Division of Program Development, Bureau of Instruction in the State Department of Education. It was felt that the program area specialists in this division would constitute a "jury of experts." These people were requested to review the four original item pools to see that the

content of the items was consistent with the goals they were intended to measure. Through this review, the "content validity" of each of the item pools was established.

The second step in instrument development was to pilot test the items to get an initial indication of how students were able to react to the items. There were two major objectives at this stage of development: to test the format of the instrumentation, and to make sure that the students who were to respond to these items could read them. As a result of pilot testing, several changes in the instrument format itself were made. For example, a special answer sheet had to be designed because of observed students difficulties with the standard answer sheet which was originally thought to be adequate. Some words were changed or eliminated because of student difficulty.

One of the more important results of the pilot testing stage was that the test administration instructions were refined. At each of the six pilot test sites, a staff member of the Office of Planning and Research was able to observe local district personnel administering the instrumentation. The feedback from such observations was most important in refining these instructions. Standardizing conditions under which all students take a test is a key step in developing a standardized test.

The third major step involved in this process was that of field testing. The purpose at this point was to obtain the statistical properties of the four pools of items so that decisions could be made about which items could be used in the scoring of the Kentucky Quality Education Questionnaire. In order to get a representative sample across the Commonwealth, the KQEQ was administered through the Kentucky Education Assessment Program in April of 1975. This resulted in a large statewide sample from which to obtain the statistical dimensions of the KQEQ, 5507 students at the eighth grade level, and 4858 students at the eleventh grade.

The first concern in the analysis of the field test data was that all items discriminate positively in the goal to which each respective item was intended to relate. This was determined by correlating each item to the appropriate total score after subtracting the contribution of the item being correlated. There were six items which correlated negatively with their corresponding total scores. Therefore, they were eliminated from all remaining analyses.

The second concern about the statistical properties of the four item pools, or scales of the KQEQ, was that they each have a reliability estimate of .60 or greater. Split-half reliability coefficients were calculated for each scale to be included. These coefficients ranged from .78 to .86 at

the eighth grade level, and from .81 to .87 at the eleventh grade levels. If any one of the scales would have had a reliability coefficient of less than .60, then it would have been considered an inadequate measure of the goal it was intended to measure. Table 2 summarizes the reliability coefficients obtained.

The above briefly described the statistics on which decisions about the KQEQ were made. As a result of the regression analyses completed for this report, the intercorrelation of the four KQEQ scales are available and are reported in Tables 3 and 4. There are strong correlations among these four scales with correlation coefficients exceeding .5 in all cases at the eighth grade level. As also reported in Table 3, three of the four scales correlate positively with General Education as measured by CTBS. Cultural Appreciation being the one exception correlates slightly negative with General Education. All four scales correlate in a positive direction with Occupational Competence.

The four scales of the KQEQ at the eleventh grade level were also moderately to strongly intercorrelated as is revealed in Table 4. The correlations with General Education at this level were positive in all four cases although the magnitude of the correlation coefficients was not as great as those at the eighth grade level.

TABLE 2: SPLIT-HALF RELIABILITY COEFFICIENTS ON SCALE OF THE KQEQ

GOAL	SCALE	GRADE 8	GRADE 11
3	Human Relationships	.86	.86
4	Citizenship	.82	.87
5	Creative, Constructive, and Critical Thinking	.78	.81
8	Cultural Appreciation	.85	.86

TABLE 3

CORRELATION OF CRITERION VARIABLES
AT THE EIGHTH GRADE LEVEL

	GEN ED	HUM REL	CITIZ	CCCT	OCU CMP	CUL APP
GEN ED	1.000	.103	.275	.357	-.546	-.077
HUM REL		1.000	.679	.801	.319	.918
CITIZ			1.000	.746	.608	.527
CCCT				1.000	.609	.661
OCU CMP					1.000	.102
CUL APP						1.000

The preceding discussion was intended to give a brief summary of the first instrument building phases of this study. A similar process will be followed in developing the remaining two scales which are to be included in the KQEQ as they are developed. A more detailed discussion of the completed instrumentation can be found in the Manual for Interpreting the Kentucky Quality Education Questionnaire (Frankfort, Ky.: Kentucky State Department of Education, October, 1975).

TABLE 4

CORRELATION OF CRITERION VARIABLES
AT THE ELEVENTH GRADE LEVELS

	GEN ED	HUM REL	CITIZ	CCCT	CUL APP
GEN ED	1.000	.072	.058	.274	.005
HUM REL		1.000	.588	.797	.881
CITIZ			1.000	.748	.399
CCCT				1.000	.631
CUL APP					1.000

INDIVIDUAL GOALS ANALYSES

The six goals for which measures were available were first analyzed individually. The results of these analyses are summarized in the following six subsections. All variables listed in the summary tables included in the following sections are significant at the .01 level. This is the default value of BMD02R program for the "F to enter." In dealing with stepwise multiple regression, it kept in mind that the variables are entered into the analysis in the order of their importance after the impact of the variables previously entered has been taken into account. Thus, the variable entered on the first step of the analysis is that which has the strongest relationship with the dependent variable being considered. The second independent variable entered is that which has the strongest relationship with the dependent variable after controlling for the impact of the first variable entered into the analysis.

Five of the summary kinds of statistics produced by the BMD02R program are reported in the twelve summary tables included in this section. The regression coefficient (b), the standard error of the regression coefficient (SE_b), the multiple correlation coefficient (R), the multiple coefficient of determination (R^2), and the percent change in R^2 at each step of the analysis. The regression coefficient and their associated standard errors are those which resulted from the last step of the analysis under consideration. As new variables are added to the analysis, these values fluctuate. The multiple correlation coefficient is that which was obtained at each step of the analysis and reflects the correlation between the dependent variable and those independent variables entered into the analysis at that particular step. This is also the case with the multiple coefficient of determination, a measure of the amount of variation accounted for in the dependent variable.

The standard errors of the regression coefficients are included to assist in the interpretation of the regression coefficients. As the absolute value of the standard error surpasses the absolute value of the regression coefficient itself, some doubt about the direction of the relationship between the dependent variables and the independent variable under consideration arises. As previously stated, all variables make a significant contribution in accounting for the variation in the dependent variable at the .01 level. Although the contribution of a variable to the analysis is significant in these situations, some problems are encountered when attempting to draw conclusions about the direction of this contribution. In most cases, a large standard error of a regression coefficient is likely to have been caused by variables entering the analysis is earlier accounting for the major portion of the variation accounted for in the dependent variable. Occasionally, variables entering the analysis will end up with relatively large standard errors due to variables entering later.

In order to assist in the interpretation of regression coefficients, asterisks preceed those variables when the absolute value of a regression coefficient exceeds the associated standard error. If a variable is not preceded by an asterisk, there can be some doubt about the direction of the relationship given the impact of those other variables in the analysis. One must always keep in mind the impact of the other variables in the analysis.

Goal 1 -- General Education: Measures of GEN ED were available for all three grade levels with which this study was concerned; fourth, eighth, and eleventh grades. This was the only goal in which appropriate measures were available at all three levels. As has been mentioned previously, one hundred and nine districts were included at the fourth grade level, ninety-two at the eighth grade level, and eighty-six at the eleventh grade. Tables 5, 6, and 7 summarize the statistical findings at the three grade levels respectively.

The stepwise multiple regression analysis of GEN ED at the fourth grade level is summarized in Table 5. As can be observed on the bottom line of this table, a multiple correlation (R) of.6642 was obtained. This resulted in a multiple coefficient of determination (R^2) of .4412 indicating that approximately forty-four percent of the variation in fourth grade GEN ED district scores could be explained by knowledge of the eighteen independent variables entered into the analysis. All eighteen of the independent variables identified for this study entered into the fourth grade GEN ED analysis.

The eighth grade analysis of GEN ED is summarized in Table 6. As can be observed on the bottom line of this table, a multiple correlation coefficient (R) of .6490 was obtained. This resulted in a multiple coefficient of determination (R^2) of .4212, and indicated that approximately forty-two percent of the variation in eighth grade GEN ED could be explained by knowledge of seventeen independent variables entered into the analysis. Pupil/administrator ratio (PUP AD) was not entered into the analysis.

The results of the eleventh grade analysis of GEN ED are summarized in Table 7. As reported on the bottom line of this table, a multiple correlation coefficient (R) of .6355 was obtained. This resulted in a multiple coefficient of determination (R^2) equal to .4039 indicating that approximately forty percent of the variation in eleventh grade GEN ED could be understood by knowledge of the seventeen variables entered into the analysis. All independent variables except average daily attendance (ADA) were entered into the analyses.

TABLE 5

SUMMARY OF ANALYSIS OF GENERAL EDUCATION (GRADE 4)

GRADE 4 GEN ED	Regression Coefficient (b)	SE b	R	R^2	Change in R^2
* EC DEP	-.25639	.08156	.4842	.2344	.2344
* TH EXP	1.05384	.47441	.5334	.2845	.0501
* ATTEND	1.60326	.85595	.5560	.3091	.0246
* TH SUP	.04228	.01891	.5747	.3303	.0212
* PUP LIB	-.00377	.00277	.5957	.3549	.0246
* PUP AD	.02835	.01422	.6143	.3773	.0244
* EXPL	1.48913	1.34233	.6264	.3924	.0150
* DELINQ	-.02517	.01803	.6334	.4012	.0089
INCOME	.0085	.00173	.6390	.4083	.0071
* HLD PWER	-.11168	.07542	.6422	.4124	.0041
RANK 2	.10421	.11156	.6470	.4186	.0062
* RANK 4	2.50157	2.13686	.6512	.4241	.0055
* DRP OTS	-.806102	.79471	.6565	.4310	.0069
PUP TH	-.37391	.44966	.6597	.4352	.0042
PUP GD	-.00086	.00140	.6615	.4376	.0024
ADA	.00036	.00061	.6626	.4391	.0015
PRG UTS	-.01753	.03326	.6638	.4407	.0016
PUP PR	-.00199	.00705	.6642	.4412	.0005
(CONSTANT)	100.03888				

*Absolute value of regression coefficient exceeds value of corresponding standard.

TABLE 6

SUMMARY OF ANALYSIS OF GENERAL EDUCATION (GRADE 8)

GRADE 8 GEN ED	b	SE b	R	R^2	Change in R^2
* EC DEP	.28412	.08708	.4506	.2030	.2030
* ATTEND	1.56178	1.00728	.5106	.2607	.0577
* PUP GD	-.00410	.00152	.5318	.2828	.0221
* HLD PWR	-.19928	.07981	.5697	.3246	.0418
* PUP LIB	-.00441	.00255	.5844	.3415	.0169
DRP OTS	.56834	.86361	.5981	.3578	.0163
* TH SUP	-.02538	.02100	.6118	.3743	.0166
* TH EXP	.52254	.46795	.6208	.3854	.0111
* RANK 2	.21346	.13457	.6278	.3941	.0087
PUP TH	.35877	.46954	.6328	.4004	.0063
RANK 4	.70476	2.19385	.6344	.4025	.0021
PUP PR	.00598	.00753	.6357	.4041	.0016
DELINQ	-.01687	.02159	.6371	.4058	.0018
INCOME	.00166	.00199	.6390	.4083	.0024
EXPL	.24467	1.44790	.6398	.4093	.0011
* PRG UTS	-.06475	.05321	.6404	.4101	.0001
* ADA	.00112	.00094	.6490	.4212	.0110
(CONSTANT)	-91.90672				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

TABLE 7

SUMMARY OF ANALYSIS OF GENERAL EDUCATION (GRADE 11)

GRADE 11 GEN ED	b	SE b	R	R^2	Change in R^2
* EC DEP	-.35129	.10177	.4790	.2295	.2295
* ATTEND	2.21832	1.10136	.5506	.3031	.0736
* TH EXP	.65436	.51740	.5683	.3229	.0198
* PUP GD	-.00314	.00213	.5786	.3348	.0118
* RANK 4	2.12949	2.12360	.5899	.3480	.0133
HLD PWR	-.10607	.12544	.6013	.3616	.0135
* DELINQ	-.02420	.02063	.6124	.3751	.0135
TH SUP	-.01983	.02274	.6182	.3822	.0071
PUP LIB	-.00365	.00374	.6250	.3906	.0084
DRP OTS	.86465	1.00142	.6279	.3942	.0036
RANK 2	.08131	.14309	.6303	.3973	.0031
EXPL	2.70619	4.09702	.6321	.3996	.0022
PUP TH	.30005	.57998	.6336	.4014	.0019
PUP PR	.00467	.01348	.6347	.4028	.0014
PUP AD	-.00530	.02504	.6350	.4032	.0003
PRG UTS	.00173	.00621	.6354	.4037	.0006
INCOME	-.00032	.00228	.6355	.4039	.0002
(CONSTANT)	-148.05887				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

Student performance in General Education at the three grade levels for which data were available related to the set of identified independent variables consistently. The amount of variation accounted for in GEN ED scores ranged from 40.39 percent at the eleventh grade level to 44.12 percent at the fourth grade level. Two of the independent variables, EC DEP and ATTEND, were consistently entered into the analysis within the first three steps of the analysis. These two variables would seem to be among the more important indicators of student performance in General Education at all three levels.

TABLE 7A: COMPARISON OF FIRST FIVE VARIABLES ENTERED INTO THE THREE GENERAL EDUCATION ANALYSES

	4th grade	8th grade	11th grade
	EC DEP TH EXP ATTEND TH SUP PUP LIB	EC DEP ATTEND PUP GD HLD PWR PUP LIB	EC DEP ATTEND TH EXP PUP GD RANK 4
% Variation accounted for by first five variables	35.49	34.15	34.80
% Variation accounted for by total analysis	44.12	42.12	40.39

As can be seen in Table 7A, there are three variables which enter within the first five steps of the analysis at two grade levels. Pupil/guidance counselor ratio (PUP GD) appears at the eighth and eleventh grades, teacher experience (TH EXP) at the fourth and eleventh, and pupil/librarian (PUP LIB) at the fourth and eighth grades. The first five variables, as can be seen, accounted for a major portion of the variation in each of the three GEN ED analyses.

Goal 3 -- Human Relationships: The results of the eighth grade analysis of HUM REL are summarized in Table 8. As can be observed on the bottom line of this table, a multiple correlation coefficient (R) of .6172 was obtained. This resulted in a multiple coefficient of determination of .3809 indicating that approximately 38 percent of the variation in local district eighth grade scores could be understood with knowledge of the seventeen independent variables entered into the analysis. All independent variables except for average daily attendance (ADA) were entered into the analysis.

TABLE 8

SUMMARY OF ANALYSIS OF HUMAN RELATIONSHIPS (GRADE 8)

GRADE 8 HUM REL	b	SE b	R	R^2	Change in R^2
* HLD PWR	-.39342	.08445	.2822	.0796	.0796
* EXPL	-3.38369	1.49321	.4056	.1645	.0849
* PUP GD	-.00513	.00157	.4951	.2451	.0806
* RANK 4	3.67835	2.28563	.5188	.2692	.0241
* PUP AD	.03802	.01635	.5376	.2891	.0199
* PUP PR	-.01617	.00888	.5608	.3145	.0254
* PRG UTS	-.00833	.00627	.5852	.3424	.0280
TH SUP	-.02087	.02192	.5962	.3554	.0130
PUP LIB	.00178	.00315	.5952	.3591	.0037
INCOME	-.00192	.00203	.6033	.3639	.0049
* ATTEND	1.08231	1.05143	.6112	.3735	.0096
PUP TH	.24777	.50013	.6130	.3758	.0023
EC DEP	-.05664	.09108	.6146	.3777	.0019
DRP OTS	.40284	.85066	.6161	.3796	.0018
TH EXP	.15276	.49163	.6168	.3804	.0009
DELINQ	-.00411	.02306	.6171	.3808	.0004
RANK 2	-.01951	.13940	.6172	.3809	.0002
(CONSTANT)	-18.36887				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

TABLE 9

SUMMARY OF ANALYSIS OF HUMAN RELATIONSHIPS (GRADE 11)

GRADE 11 HUM REL	b	SE b	R	R^2	Change in R^2
* PUP PR	.02524	.01408	.1302	.0170	.0170
* ATTEND	1.62863	1.28982	.1927	.0371	.0202
* EXPL	9.17016	4.83043	.2601	.0677	.0305
* TH SUP	.03457	.02572	.2884	.0832	.0155
* RANK 4	2.96904	2.53359	.3206	.1028	.0196
* DELINQ	.03779	.02387	.3393	.1151	.0124
TH EXP	.47740	.58893	.3638	.1324	.0172
* DRP OTS	1.75583	1.18387	.3784	.1432	.0108
HLD PWR	.10326	.14964	.39427	.1558	.0126
RANK 2	.13709	.15879	.4026	.1621	.0063
PUP AD	-.02121	.02713	.4133	.1708	.0087
PUP TH	.25255	.68851	.4156	.1727	.0019
PUP GD	-.00097	.00228	.4176	.1744	.0016
EC DEP	-.02207	.10272	.4181	.1748	.0004
PUP LIB	-.00046	.00432	.4182	.1749	.0001
(CONSTANT)	-140.00017				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

The results of the analysis of the eleventh grade HUM REL scores are summarized in Table 9. As can be seen on the bottom line of this table, a multiple correlation coefficient (R) of .4182 was obtained. This resulted in a multiple coefficient of determination (R^2) of .1749 indicating that approximately 17 percent of the variation in eleventh grade district scores could be explained through knowledge of the fifteen variables entered into the analysis, considerably less than was explained at the eighth grade level. Three of the eighteen independnt variables, program units offered (PRG UTS), per capita income (INCOME), and average daily attendance (ADA), were not entered into the analysis. Given the fifteen variables already in the analyses, these three variables made no significant contribution to the understanding of student performance in this area.

Student performance in HUM REL does not seem to relate to the identified set of independent variables at the eighth grade level in the same manner as it does at the eleventh grade level. Although 38.09 percent of the variation in eighth grade HUM REL scores could be understood by knowledge of the variables listed in Table 8, only 17.4 percent of the variation in eleventh grade HUM REL could be understood through knowledge of the variables.

TABLE 9A: COMPARISON OF THE FIRST FIVE VARIABLES ENTERED INTO THE TWO HUMAN RELATIONSHIP ANALYSES

	8th grade	11th grade
	HLD PWR EXPL PUP GD RANK 4 PUP AD	PUP PR ATTEND EXPL TH SUP RANK 4
% Variation accounted for by the first five variables	28.91	10.28
% Variation accounted for by total analysis	38.08	17.49

Only two of the variables listed in Table 9A, expulsion rate (EXPL), and percent of professional staff certified Rank 4 (RANK 4) appear in the first five variables in both equations. Future research efforts should be directed toward identifying variables which would be better, and more consistent indicators of student performance in this area, especially at the eleventh grade level.

Goal 4 -- Citizenship: Measures of citizenship (CITIZ) were available at both the eighth and eleventh grades. The eighth grade results are summarized in Table 10. As can be observed on the bottom line of this table, a multiple correlation coefficient (R) of .5937 was obtained. This resulted in a multiple coefficient of determination of .3518 indicating that approximately 35 percent of the variation in eighth grade CITIZ district scores could be understood with knowledge of the eighteen independent variables entered into the analysis. All eighteen independent variables identified in this study were entered into the analysis.

The results of the analysis of eleventh grade CITIZ district scores are summarized in Table 11. As is reported on the bottom line of this table, a multiple correlation (R) of .4946 was obtained. This resulted in a multiple coefficient of determination (R^2) equal to .2446 indicating that approximately 24 percent of the variation in eleventh grade CITIZ scores could be understood through knowledge of the seventeen independent variables entered into the analysis. All independent variables except percent ninth graders graduating from high school (HLD PWR) were entered into the analysis.

Independent variables, as was discussed in the section "Methodology," were selected according to certain statistical criteria for inclusion in the analysis. An option in the analysis which has not received a great deal of attention is that of removing a variable if its contribution becomes statistically insignificant after the impact of one or more of the following variables is considered. The eleventh grade analysis of CITIZ is the only one of the twelve analyses run in which this option was exercised.

Thus, pupil/administrator ratio (PUP AD) appears three times in the analysis reported in Table 11. PUP AD was added to the analysis on the second step. It was then removed from the analysis of the fourteenth step, and re-entered again on the twentieth and final step of the analysis. Therefore, no regression coefficients or associated standard errors are reported the first two times PUP AD appears in the analysis.

TABLE 10

SUMMARY OF ANALYSIS OF CITIZENSHIP (GRADE 8)

GRADE 8 CITIZ	b	SE b	R	R^2	Change in R^2
* HLD PWR	-.37776	.09017	.1925	.0371	.0731
* EXPL	-2.20786	1.60484	.2999	.0899	.0529
* PUP GD	-.00316	.00169	.3581	.1282	.0383
* PUP AD	.06022	.01739	.4045	.1636	.0354
* PUP PR	-.02116	.00945	.4797	.2301	.0665
ADA	-.00038	.00104	.4975	.2476	.0174
* TH SUP	-.04110	.02331	.5158	.2660	.0184
EC DEP	-.05159	.09817	.5360	.2873	.0213
* DELINQ	-.05343	.02453	.5649	.3191	.0318
* RANK 2	.19673	.15014	.5790	.3353	.0162
INCOME	.00154	.00221	.5872	.3448	.0095
ATTEND	.60862	1.13473	.5888	.3467	.0020
PUP LIB	.00185	.00335	.5909	.3492	.0025
RANK 4	.88498	2.43338	.5918	.3503	.0011
TH EXP	-.16152	.52332	.5924	.3509	.0007
PRG UTS	.00831	.09504	.5928	.3514	.0004
PUP TH	-.09878	.53534	.5930	.3517	.0003
DRP OTS	-.10139	.97164	.5931	.3518	.0001
(CONSTANT)	14.44728				

*Absolute value of regression coefficient exceeds value of corresponding

TABLE 11

SUMMARY OF ANALYSIS OF CITIZENSHIP (GRADE 11)

GRADE 11 CITIZ	b	SE b	R	R^2	Change in R^2
* PUP TH	-1.15352	.64749	.2162	.0467	.0467
PUP AD			.2859	.0818	.0350
* ATTEND	2.46580	1.26313	.3246	.1054	.0236
* RANK 4	4.02072	2.41345	.3731	.1392	.0338
* TH SUP	.04632	.02610	.3888	.1496	.0105
* INCOME	.00572	.00263	.4000	.1600	.0103
* EC DEP	.18023	.11447	.4430	.1963	.0363
* TH EXP	.79136	.59286	.4583	.2101	.0138
* PUP PR	.02291	.01548	.4699	.2208	.0107
DELINQ	.02091	.02382	.4744	.2250	.0043
PUP GD	.00242	.00249	.4775	.2280	.0029
PUP LIB	.00305	.00429	.4821	.2325	.0045
RANK 2	.10521	.15910	.4878	.2380	.0055
PUP AD			.4878	.2380	-.0000
EXPL	-1.97122	4.36383	.4904	.2405	.0025
PRG UTS	.03325	.05662	.4907	.2408	.0003
ADA	-.00057	.00100	.4936	.2436	.0029
DRP OTS	.28432	1.15579	.4940	.2441	.0005
PUP AD	-.00627	.02863	.4946	.2446	.0005
(CONSTANT)	-215.32994				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

Again, some differences would seem to exist in the strength of the relationships between student performance in citizenship and the identified set of independent variables at the eighth and eleventh grade levels. As was reported in Tables 10 and 11, 35.18 percent of the variation in eighth grade CITIZ could be explained by the variables in the analysis, while only 24.46 percent of the variation at the eleventh grade level could be explained.

TABLE 11A: COMPARISON OF THE FIRST FIVE VARIABLES ENTERED IN THE TWO CITIZENSHIP ANALYSES

	8th grade	11th grade
	HLD PWR EXPL PUP GD PUP AD PUP PR	PUP TH PUP AD ATTEND RANK 4 TH SUP
% Variation accounted for by first five variables	23.01	14.96
% Variation accounted for by total analysis	35.18	24.46

As can be observed in the above table, pupil/administrator (PUP AD) ratio was the only variable to enter both analyses within the first five steps. There are some differences in which variables would seem to be the most important indicators of student performance in this area.

Goal 5 -- Creative, Constructive, and Critical Thinking: Measures of CCCT were available at the eighth and eleventh grades. The results of the eighth grade analysis are summarized in Table 12. As is reported on the bottom line of this table, a multiple correlation coefficient (R) of .6141 was obtained. This resulted in a multiple coefficient of determination .3771 indicating that approximately thrity-eight percent of the variation in local district eighth grade CCCT scores could be understood through knowledge of the eighteen independent variables entered into the analysis. All eighteen independent variables identified in this study were included in this analysis.

The results of the eleventh grade local district CCCT scores have been summarized in Table 13. As is reported on the bottom line of this table, a multiple regression coefficient (R) of .5068 was obtained. This resulted in a multiple coefficient of determination (R^2) equal to .2568 indicating that approximately twenty-six percent of the variation in eleventh grade CCCT scores could be understood through knowledge of the fifteen independent variables included in the analysis. Pupil/teacher ratio (PUP TH), number

TABLE 12

SUMMARY OF ANALYSIS OF CREATIVE, CONSTRUCTIVE, AND CRITICAL THINKING (GRADE 8)

GRADE 8 CCCT	b	SE b	R	R^2	Change in R^2
* EXPL	-2.53456	1.59966	.2699	.0728	.0728
* HLD PWR	- .37877	.08988	.3501	.1226	.0497
* PUP GD	-.00478	.00168	.4307	.1855	.0630
* EC DEP	-.20032	.09786	.4748	.2254	.0399
* TH SUP	-.03126	.02323	.5048	.2548	.0294
TH EXP	.41383	.52163	.5285	.2793	.0245
* PUP AD	.03900	.01734	.5444	.2964	.0170
* ATTEND	2.00666	1.13106	.5622	.3161	.0197
* RANK 4	3.33536	2.42551	.5733	.3287	.0126
* PUP PR	-.01324	.00942	.5832	.3401	.0114
INCOME	-.00175	.00220	.5976	.3571	.0170
PRG UTS	.00740	.05885	.6046	.3655	.0083
DELINQ	-.02112	.02445	.6103	.3725	.0070
DRP OTS	.39762	.96850	.6120	.3746	.0021
PUP LIB	.00111	.00334	.6129	.3756	.0011
ADA	-.00025	.00104	.6133	.3761	.0005
PUP TH	.14921	.53361	.6138	.3768	.0006
RANK 2	.02817	.14965	.6141	.3771	.0003
(CONSTANT)	-103.98866				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

TABLE 13

SUMMARY OF ANALYSIS OF CREATIVE, CONSTRUCTIVE, AND CRITICAL THINKING (GRADE 11)

GRADE 11 CCCT	b	SE b	R	R^2	Change in R^2
* EC DEP	-.03114	.11516	.2704	.0731	.0731
* ATTEND	2.25008	1.22187	.3260	.1063	.0331
* RANK 4	4.15635	2.40865	.3667	.1344	.0282
* TH SUP	.05098	.02520	.4025	.1620	.0276
* PUP PR	.02183	.01499	.4243	.1800	.0180
* EXPL	5.82945	4.44029	.4452	.1982	.0182
* RANK 2	.20052	.16065	.4656	.2168	.0186
* INCOME	.00270	.00253	.4786	.2291	.0123
* TH EXP	.60836	.58608	.4902	.2403	.0113
DELINQ	.02121	.02293	.4968	.2468	.0065
HLD PWR	.09095	.13658	.5012	.2512	.0044
DRP OTS	.62191	1.12999	.5049	.2549	.0037
PUP AD	-.01082	.02694	.5062	.2562	.0013
PUP GD	.00049	.00238	.5065	.2565	.0003
PUP LIB	.00074	.00422	.5068	.2568	.0003
(CONSTANT)	-206.85625				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

of program units offered (PRG UTS), and average daily attendance (ADA) did not enter the analysis.

Some differences are apparent when comparing the analyses of Creative, Constructive, and Critical Thinking at the eighth and eleventh grades. While all eighteen independent variables entered the eighth grade analysis, only fifteen entered the eleventh grade analysis. The amount of variation accounted for in CCCT scores dropped from 37.71 percent at the eighth grade level to 25.68 percent at the eleventh grade level. This of course suggests a difference in the way eighth grade CCCT scores relate to the identified set of independent variables, and in the way eleventh grade scores relate to the same set of variables.

TABLE 13A: COMPARISON OF THE FIRST FIVE VARIABLES ENTERED INTO THE TWO CREATIVE, CONSTRUCTIVE, AND CRITICAL THINKING ANALYSES

	8th grade	11th grade
	EXPL HLD PWR PUP GD EC DEP TH SUP	EC DEP ATTEND RANK 4 TH SUP PUP PR
% Variation accounted for by first five variations	25.48	18.00
% Variation accounted for by total analysis	37.71	25.68

As can be seen in the above table, there were two independent variables entering both analyses within the first five steps. They were percent of students economically deprived (EC DEP), and teacher/instructional supervisor ratio (TH SUP). Future research in this area might also be focused on identifying more effective indicators of student performance in this area.

Goal 7 -- Occupational Competence: An adequate measure of Occupational Competence (OCU CMP) was available at only the eighth grade level. The stepwise multiple regression analysis of OCU CMP scores is summarized in Table 14. As can be seen on the bottom line of this table, a multiple correlation coefficient (R) of .5697 was obtained. This resulted in a multiple coefficient of determination (R^2) equal to .3246 indicating that

TABLE 14

SUMMARY OF ANALYSIS OF OCCUPATIONAL COMPETENCE
(GRADE 8)

GRADE 8 OCU CMP	b	SE b	R	R^2	Change in R^2
* RANK 2	.32281	.14914	.2820	.0795	.0795
* INCOME	.00334	.00219	.3551	.1261	.0466
* TH EXP	.74597	.51983	.4192	.0757	.0496
* DELINQ	-.04984	.02436	.4454	.1984	.0226
* TH SUP	-.04320	.02315	.4757	.2263	.0280
* PUP GD	-.00327	.00168	.4891	.2392	.0129
* HLD PWR	-.20253	.08957	.5062	.2562	.0170
* EC DEP	-.11114	.09752	.5192	.2696	.0134
* PUP PR	-.01177	.00939	.5352	.2864	.0168
* PUP AD	.02418	.01728	.5446	.2966	.0102
PRG UTS	-.05083	.05865	.5504	.3029	.0063
DRP OTS	-.62175	.96517	.5544	.3074	.0045
ADA	.00082	.00104	.5601	.3137	.0063
PUP TU	-.29295	.53177	.5638	.3179	.0042
RANK 4	1.50012	2.41718	.5670	.3215	.0036
ATTEND	.48018	1.12707	.5684	.3231	.0016
PUP LIB	-.00118	.00333	.5694	.3242	.0011
EXPL	.31619	1.59416	.5697	.3246	.0004
(CONSTANT)	10.60843				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

TABLE 15

SUMMARY OF ANALYSIS OF CULTURAL APPRECIATION
(GRADE 8)

GRADE 8 CUL AP	b	SE b	R	R^2	Change in R^2
* HLD PWR	-.38534	.08254	.3847	.1480	.1480
* EXPL	-3.27894	1.46895	.4518	.2041	.0561
* PUP GD	-.00426	.00154	.5294	.2802	.0761
* RANK 4	4.07064	2.22732	.5584	.3119	.0316
* INCOME	-.00218	.00202	.5891	.3470	.0352
TH SUP	-.01546	.02133	.5977	.3572	.0102
PRG UTS	-.01154	.05404	.6052	.3663	.0091
* PUP AD	.02379	.01592	.6162	.3797	.0134
ATTEND	1.03236	1.03864	.6205	.3850	.0053
* PUP PR	-.00918	.00865	.6249	.3905	.0055
* PUP LIB	.00306	.00306	.6289	.3955	.0050
TH EXP	.27014	.47901	.6307	.3978	.0023
RANK 2	-.06115	.13743	.6320	.3994	.0016
DELINQ	.01046	.02245	.6335	.4013	.0019
EC DEP	.03949	.08986	.6346	.4027	.0014
PUP TH	.14832	.49001	.6352	.4035	.0008
DRP OTS	-.11615	.88936	.6352	.4035	.0001
ADA	.00010	.00096	.6353	.4036	.0001
(CONSTANT)	-15.49994				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

TABLE 16

SUMMARY OF ANALYSIS OF CULTURAL APPRECIATION
(GRADE 11)

GRADE 11 CUL AP	b	SE b	R	R^2	Change in R^2
* EXPL	9.55722	5.03112	.1615	.0261	.0261
* RANK 4	4.18740	2.62180	.2205	.0486	.0225
* TH SUP	.04190	.02745	.2624	.0688	.0202
PUP PR	.01548	.01658	.2918	.0852	.0163
TH EXP	.55839	.63629	.3232	.1044	.0193
ATTEND	.88441	1.33926	.3448	.1189	.0145
RANK 2	.12377	.17450	.3548	.1259	.0070
DRP OTS	1.03105	1.16356	.3638	.1324	.0065
PUP GD	-.00152	.00243	.3723	.1386	.0063
PUP TH	.48247	.71967	.3766	.1419	.0032
HLD PWR	.06591	.15049	.3794	.1439	.0021
PUP LIB	.00207	.00429	.3822	.1460	.0021
PRG UTS	-.01829	.06037	.3843	.1477	.0016
ADA	.00030	.00107	.3863	.1493	.0010
DELINQ	.01257	.02559	.3882	.1507	.0015
PUP AD	-.00746	.03129	.3901	.1522	.0014
INCOME	-.00046	.00238	.3907	.1526	.0005
(CONSTANT)	-71.05951				

*Absolute value of regression coefficient exceeds value of corresponding standard error.

approximately thirty-two percent of the variation in OCU CMP could be understood through knowledge of the eighteen independent variables entered into the analysis. All independent variables identified for this study were included in this analysis.

Goal 8 -- Cultural Appreciation: Measures of Cultural Appreciation (CUL APP) were available at both the eighth and eleventh grade levels. The results of the eighth grade analysis are summarized in Table 15. As can be observed on the bottom line of this table, a multiple correlation coefficient (R) of .6353 was obtained. This resulted in a multiple coefficient of determination (R^2) equal to .4036 indicating that approximately forty percent of the variation in eighth grade CUL APP scores could be explained through knowledge of the eighteen variables included in the analysis. All eighteen independent variables identified for purposes of this study were included in this analysis.

The results of the eleventh grade analysis of CUL APP scores are summarized in Table 16. As can be observed on the bottom line of this table, a multiple correlation coefficient (R) of .3907 was obtained. This resulted in a multiple coefficient of determination (R^2) equal to .1526 indicating that approximately fifteen percent of the variation in eleventh grade CUL APP scores could be explained through knowledge of the seventeen independent variables included in the analysis. The percent of students economically deprived (EC DEP) did not enter this analysis. This was the only analysis in which this variable did not enter.

Again, obvious differences in the CUL APP scores relate to the identified set of independent variables at the two grade levels exist. As was reported in Table 16A, 40.36 percent of the variation in eighth grade scores could be explained by those independent variables listed in Table 15, while only 15.26 percent of the variation in eleventh grade CUL APP scores could be explained by the independent variables listed in Table 16.

TABLE 16A: COMPARISON OF THE FIRST FIVE VARIABLES ENTERED IN THE TWO CULTURAL APPRECIATION ANALYSES

	8th grade	11th grade
	HLD PWR EXPL PUP GD RANK 4 INCOME	EXPL RANK 4 TH SUP PUP PR TH EXP
% Variation accounted for by first five variables	34.70	10.44
% Variation accounted for by total analysis	40.36	15.26

Although two of the variables, expulsion rate, (EXPL) and percent of professional staff certified Rank 4 (RANK 4), appear within the first five steps of both analyses, the relationship at the eleventh grade level seem considerably weaker.

QUALITY RANKING ANALYSES
(OVERALL STUDENT PERFORMANCE)

The analysis of the "Quality Rankings" was completed through the use of multiple stepwise discriminant analysis. As previously discussed, the Quality Rankings were determined by averaging the six student performance scores at the eighth grade and by averaging the five student performance scores at the eleventh grade and then ranking the averages separately at each grade level. After this process was completed, the top ranking thirty districts and the bottom ranking thirty districts were selected for the separate analyses at both the eighth and eleventh grades. In those cases where two or more districts were tied in rankings at the thirtieth position either from the top or bottom, those districts were included. This process resulted in thirty districts included in both the top and bottom groups at the eighth grade level. The process resulted in thirty-one districts included in the low group and thirty districts in the high group at the eleventh grade level. As previously discussed, the "canned computer program" BMD07M was used to complete the analyses.

The default values of the BMD07M program were not altered. Thus, variables were entered into the analyses according to the magnitude of the associated F-to-enter value.

Eighth Grade Quality Ranking Analysis: Tables 16B and 16C summarize the analysis of the eighth grade Quality Rankings. The variables listed in Table 16B are listed in the order in which they were entered into the analysis. The equations reported in the columns labeled "Low Function" and "High Function" are those reported after the seventeenth and final step of the analysis. Also reported in Table 16B are the appropriate Low Group and High Group means for each independent variable. Although listed in this table so as to report the difference in means, the juvenile delinquency (DELINQ) was not entered into this analysis. Thus, it can be observed that the average expulsion rate (EXPL) for the low group was .45 while the average expulsion rate for the high group was only .17.

Probably the most important information to be gained from Table 16B is the order in which the independent variables were entered into the analysis. At the eighth grade level, the most important variable in discriminating between districts with high levels of overall student performance and districts with low levels of overall student performance was holding power (HLD PWR), or percent of ninth graders graduating from high school. Holding power was followed in importance by: pupil/guidance counselor ratio (PUP GD), expulsion rate (EXPL), pupil/administrator ratio (PUP AD), average daily attendance (ADA), etc.

TABLE 16B

Discriminant Analysis Quality Rankings (Grade 8)	Low Function	High Function	Low Group Mean	High Group Mean
HLD PWR	.77015	.67469	69.37	61.87
PUP GD	.05085	.04965	1493.84	1252.78
EXPL	60.99884	60.46672	.45	.17
PUP AD	.26026	.27401	284.21	305.37
ADA	-.04390	-.04470	2772.79	2177.65
PUP PR	-.01167	-.01657	489.55	497.82
EC DEP	3.42602	3.39615	34.77	29.53
RANK 4	-32.59892	-31.56482	.10	.19
DRP OTS	35.42549	35.72771	1.89	1.97
TH SUP	.54799	.54300	113.25	103.34
PRG UTS	2.30887	2.32835	64.88	56.52
PUP LIB	.01411	.01477	595.12	745.14
ATTEND	136.89577	137.02536	93.60	94.00
TH EXP	1.28736	1.37615	10.15	10.29
RANK 2	-3.97223	-3.94869	34.60	35.52
INCOME	-.03070	-.03048	3563.13	3746.63
PUP TH	16.74361	16.71582	22.47	22.81
DELINQ	NE	NE	45.80	45.12
Constant	-6732.10938	-6738.73438		

NE - NOT ENTERED

TABLE 16C: CONFUSION MATRIX (GRADE 8)

	Low	High
Low	24	6
High	6	24

Table 16C, a confusion matrix, summarizes the internal classification of the sixty districts included in the eighth grade analysis; thirty identified as high performance districts and thirty identified as low performance districts. As can be observed, twenty-four of those districts originally classified as low performance districts were correctly classified as "low" while the other six were incorrectly classified as "high." A chi square test was applied to this matrix to determine whether or not the pattern of classification differs significantly from that pattern of classification which would be obtained if districts were assigned to groups randomly. The formula used to obtain the value of chi square was:

$$Q = \frac{(N - nK)^2}{N\,(K-1)}$$

where: Q has a chi square distribution with one degree of freedom
N= total number of observations
n= total number of observations correctly classified
K= number of groups

Using this formula, a value of 21.60 is obtained, significant at the .001 level. Thus, the internal classification is significantly better than that which would be expected if districts were assigned to groups randomly.

Eleventh Grade Quality Ranking Analysis: The eleventh grade Quality Ranking analysis is summarized in Tables 16D and 16E. Table 16D includes the same kinds of information as was reported in Table 16B. Again, the variables are listed in the order in which they were entered into this analysis. As was the case in the previous analysis, this is probably the most meaningful information reported in this table.

TABLE 16D

Discriminant Analysis Quality Rankings (Grade 11)	Low Function	High Function	Low Group Mean	High Group Mean
ATTEND	140.01955	140.95135	93.25	93.99
RANK 4	56.53499	58.38089	.11	.26
PUP PR	.40616	.41578	469.04	521.54
TH SUP	1.21163	1.22818	100.59	108.96
EXPL	76.64735	79.07088	.14	.15
PRG UTS	.73973	.74198	72.04	114.17
TH EXP	1.91816	2.18649	10.33	10.38
INCOME	.04284	.04323	3467.94	3698.57
PUP AD	-.36827	-.37854	317.64	334.54
DRP OTS	12.57664	13.00450	2.24	1.94
EC DEP	2.85602	2.81646	35.59	27.64
PUP GD	.11417	.11351	1425.52	1235.38
PUP LIB	.08330	.08258	666.04	607.18
PUP TH	21.34145	21.48157	22.86	22.65
DELINQ	-.27372	-.27029	36.37	52.14
RANK 2	.78588	.79475	35.52	37.31
ADA	-.01030	-.01030	3072.26	5273.59
HLD PWR	-.29907	-.29283	67.06	70.98
Constant	-7146.60156	-7244.41406		

As can be observed in this table, the most important independent variable in discriminating between districts with high levels of overall student performance and districts with lower levels of student performance was percent of students in average daily attendance (ATTEND). It was followed in importance by percent of teachers certified Rank 4 (RANK 4), pupil/principal ratio (PUP PR), teacher/instructional supervisor ratio (TH SUP), expulsion rate (EXPL), etc.

TABLE 16E: CONFUSION MATRIX (Grade 11)

	Low	High
Low	25	6
High	9	21

Table 16E, a confusion matrix, summarizes the internal classification of the sixty-one districts included in the eleventh grade analysis; thirty-one in the "low" group and thirty in the "high" group. As can be seen in Table 16E, twenty-five of the thirty-one districts identified as low performing districts were correctly classified as "low." Twenty-one of the thirty districts identified as

high performance districts were correctly classified as "high." Using the formula described previously,

$$Q = \frac{(N-nK)^2}{N(K-1)}$$

where Q has a chi square distribution with one degree of freedom, a value of 15.75 was obtained which is significant at the .001 level. Thus, the classification is significantly better than would be expected if the districts had been assigned to high and low groups randomly.

TABLE 16F: A COMPARISON OF THE EIGHTH AND ELEVENTH GRADES QUALITY RANKING ANALYSES

	Step Entered Analysis	
	Grade 8	Grade 11
RANK 2	15	16
RANK 4	8	2
PUP TH	17	14
PUP GD	2	12
TH EXP	14	7
ATTEND	13	1
PUP AD	4	9
PUP PR	6	3
TH SUP	10	4
PRG UTS	11	6
PUP LIB	12	13
EXPL	3	5
EC DEP	7	11
DELINQ*	NE	15
INCOME	16	8
DRP OTS	9	10
ADA	5	17
HLD PWR	1	18

*NE: variable not entered in analysis

Table 16F compares the eighth and eleventh grade analyses of Quality Rankings. In the two columns labeled "Grade 8" and "Grade 11," the step in which the independent variable listed in the left hand column was entered into the respective analyses is reported. As can be observed in this table, there is not a tremendous amount of agreement in the order in which the independent variables entered the eighth grade analysis and the order in which they entered the eleventh grade analysis.

SUMMARY AND CONCLUSIONS

Summary of the Impact of Individual Variables on Individual Goals: The previous discussion has been centered around the twelve separate analyses of student performance through the use of stepwise multiple regression. In this section, the impact of each of the eighteen independent variables on the six individual measures of student performance will be summarized. The direction of the contribution of an independent variable, positive or negative to the understanding of any one of the student performance measures will be considered only when the absolute value of the regression coefficient exceeds the value of the associated standard error. This is an arbitrary decision indicating that for purposes of this study the absolute value of a regression coefficient must differ from zero by at least one standard error before any statement about the sign of the coefficient will be considered. Again, when this criterion is not met, one should not assume that the relationship under consideration is not significant. It is more appropriately considered an indication that some of the variation in the measure of student performance which would have been accounted for by the independent variable under discussion had it been considered alone is being accounted for by other variables in the analysis.

The contribution of an independent variable to the understanding of the variation in student performance must not be considered independently of the other independent variables in the analysis. The remainder of this section will be dealing with the directions of the relationships between the eighteen independent variables and the six measures of student performance. In reading this section, one must keep in mind that the relationships discussed must take into consideration the other independent variables. For example, the relationship between per capita income (INCOME) and student performance will be summarized in Table 19. There it will be found that a positive relationship is reported between INCOME and Occupational Competence (OCU CMP). But it must be remembered that this relationship is affected by the other seventeen independent variables entered into this particular analysis which was presented in Table 16. If there is some interest in the relationship between an independent variable and student performance discounting the other independent variables, Tables 2, 3, and 4 of Appendix A should be consulted. In these tables, the zero order correlation coefficients of independent variables to student performance, or criterion variables, have been reported.

EC DEP: The percent of student economically deprived has been labeled a community input variable over which a school district has little or no control. It is a condition with which a school district must contend. As can be seen in Table 17, EC DEP was found to be a significant indicator of student performance in eleven of the twelve analyses previously described, and a significant indicator of performance in all six goals considered in this study in at least one grade level. Only in the analysis of eleventh grade Cultural Appreciation was EC DEP found not to be a significant indicator.

TABLE 17: SUMMARY OF THE RELATIONSHIPS BETWEEN PERCENT OF STUDENTS ECONOMICALLY DEPRIVED AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	-	-	-
Human Relationships	///	*	*
Citizenship	///	*	+
Creative, Constructive, and Critical Thinking	///	-	-
Occupational Competence	///	-	///
Cultural Appreciation	///	*	NE

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regreesion coefficient
NE not entered in analysis

In general, EC DEP seems to be negatively related to student performance. The notable exception is eleventh grade Citizenship. There were four points at which no conclusions about the relationships between EC DEP and student performance could be made according to the criterion previously stated. The standard errors of the regression coefficient were too large.

A negative relationship between EC DEP and student performance is consistent with the results of similar kinds of research efforts. Lower levels of academic achievement are usually associated with higher levels of economic deprivation. The relationship between eleventh grade students performance and EC DEP does not conform to these expectations. The relationship is in a positive direction. If this exception is confirmed through future research, then a unique condition will have been uncovered, a condition where students who consistently score low on measures of an academic nature would tend to score high on this particular measure of citizenship. If the variables contributing to the higher citizenship scores could be identified, the possibilities of transferring the impact of these variables to academic performance would then exist. The reverse kind of investigation might lead to the identification of variables influencing higher citizenship scores among lower economic groups. The impact of this could be transferred to lower scoring groups of students on the citizenship instrument. Investigations of this nature should use those variables listed in Tables 5, 6, 7, 10, and 11 as a starting point but certainly should not be limited only to these variables.

DELINQ: The juvenile delinquency rate has been defined as a community input variable. Although this condition is one on which the school would hope to have an impact, it is a condition over which the school seems to have very little direct control. In considering the relationships between this particular measure of delinquency and measures of student performance, the manner in which

these data were collected must be re-emphasized. This information is "requested" from the counties with no assurances that the counties will respond or even that every county keeps records of the desired data. If a county chooses not to respond for one reason or another, they are considered to have no juvenile delinquents. Therefore, besides being an indicator of juvenile delinquency, DELINQ may also be indicating a county's willingness to report such data, its ability to detect such occurrences, etc.

Table 18 summarizes the impact of DELINQ on student performance in each of the six goals for which measures are available. In six of these analyses, however, the standard error of the regression coefficient was large enough to prohibit any statement about the direction of the relationships according to the criterion stated in the beginning of this section. In five of the six cases where the standard error did not exceed the absolute value of the regression coefficient, the relationships between student performance and DELINQ were negative. These were the kinds of relationships one would intuitively suspect. It would stand to reason that student performance would be higher in communities where delinquent activity was lower. In general, occurences of this kind would be expected to disrupt an atmosphere which might otherwise be conducive to learning.

TABLE 18: SUMMARY OF THE RELATIONSHIPS BETWEEN JUVENILE DELINQUENCY AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	-	*	-
Human Relationships	///	*	+
Citizenship	///	-	*
Creative, Constructive, and Critical Thinking	///	*	*
Occupational Competence			
Cultural Appreciation	///	*	*

/// no measure of studnet performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

The one obvious exception to the above described relationship is that between DELINQ and eleventh grade Human Relationships. In this case the relationship was in a positive direction. Human Relationships is the area of student performance which based on intuition alone, would have the strongest negative relationship with DELINQ. However, the data does not empirically support what would seem to be an intuitively sound hypothesis when the relationship with delinquency takes into consideration those other independent variables listed in Table 9.

Any number of alternative hypotheses which might explain this inconsistency could be formulated. It might be, for example, that students in those communities where juvenile delinquency is a relatively large problem have a better understanding of what "should" be. A program designed to reduce the juvenile delinquency rate might only be increasing students' knowledge of how people within a society should conduct themselves and be falling short of teaching them to implement this knowledge. A number of other alternative hypotheses could be stated. However, further research would be needed to confirm or reject any of these.

INCOME: Per capita income has been defined as a community input variable. The schools have no direct control over this variable. As can be seen in Table 19, the only analysis in which INCOME did not enter was the analysis of eleventh grade Human Relationships.

TABLE 19: SUMMARY OF THE RELATIONSHIPS BETWEEN PER CAPITA INCOME AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	*	*	*
Human Relationships	///	*	NE
Citizenship	///	*	+
Creative, Constructive, and Critical Thinking	///	*	+
Occupational Competence	///	+	///
Cultural Appreciation	///	-	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Income would be expected to have a positive relationship on student performance based upon the results of previous research relating economic measures of student performance in seven of the eleven instances where INCOME entered an analysis, the standard error of the associated regression coefficient was too large to allow any conclusions about the direction of the relationships. In three of the four cases where this was not the situation, the relationship was positive as can be seen in Table 19. The one negative relationship was found in the analysis of eighth grade Cultural Appreciation.

DRP OTS: The rate of those students sixteen years of age and older dropping out of school has also been defined as a community input variable. Although it is assumed that the school can influence students and certainly should

encourage students not to drop out, the school has no legal authority to prevent such occurrences. Community factors, both economic and social, are assumed to play an important role in a student's decision to stay or not to stay in school. The school would seem to have little control over these factors.

TABLE 20: SUMMARY OF THE RELATIONSHIPS BETWEEN THE DROP OUT RATE AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	-	*	*
Human Relationships	///	*	+
Citizenship	///	*	*
Creative, Constructive, and Critical Thinking	///	*	*
Occupational Competence	///	*	///
Cultural Appreciation	///	*	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Table 20 summarizes the relationships between the drop out rate (DRP OTS) and the various measures of student performance. As can be seen, DRP OTS entered every analysis, however, in ten of the twelve analyses, the standard error of the associated regression coefficient was too large to allow for any statements concerning the direction of these relationships. In the two cases where the standard error of the regression coefficients were not too large, the results were conflicting. The relationship with General Education at the fourth grade level was negative while the relationships with eleventh grade Human Relationships is positive. Results of this nature present some problems because logical arguments could be developed to support both kinds of relationships.

The argument could be made that a low drop out rate is an indication that the atmosphere within the school is conducive to learning, encouraging students to stay in school, and thereby encouraging higher levels of achievement. This logic would be supported by the negative relationship between DRP OTS and General Education. The opposite kind of logic would argue that higher drop out rates would tend to eliminate those students who were not truly interested in learning thereby tending to increase achievement. The pattern of relationships presently observable is not consistent enoughto support either argument.

ADA: Average daily attendance (ADA) has been identified in this study as a community input variable. It is an indication of the total number of students attending school in a given district. This is another variable over which the school would seem to have little or no control.

TABLE 21: SUMMARY OF THE RELATIONSHIPS BETWEEN AVERAGE DAILY ATTENDANCE AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	*	+	NE
Human Relationships	///	NE	NE
Citizenship	///	*	*
Creative, Constructive, and Critical Thinking	///	*	NE
Occupational Competence	///	*	///
Cultural Appreciation	///	*	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Average daily attendance (ADA), as can be observed in Table 21, entered into only eight of the twelve analyses of student performance. It was found to be of significant importance in only two areas of student performance at the eleventh grade level, Citizenship and Cultural Appreciation. ADA did not enter the analysis of Human Relationships at either the eighth or eleventh grade levels.

Again, there would seem to be two opposing hypotheses concerning the direction of the relationship of ADA with student performance. It can be argued that both have some logical appeal. First, some would argue that smaller districts tend to emphasize the individual person because of their small size and thereby encourage higher levels of student achievement. This would be evidenced by a negative relationship between student performance and ADA. The opposing point of view might argue that larger districts could offer a greater variety of educational programs thereby encouraging a higher level of student performance. This would be evidenced by a positive relationship between ADA and student performance.

The empirical data gathered for this study does little to support either point of view in most of the areas of student performance considered in this study. In only one of the eight cases where ADA entered the analyses was the relationship such that any statement about the direction of the relationship could be made.

In the analysis of eighth grade General Education, ADA was associated with performance in a positive direction. In the remaining seven cases, the standard error of ADA's regression coefficient was too large to make any statements about direction when ADA was considered in combination with the other independent variables.

HLD PWR: Percent of ninth graders graduating from high school (HLD PWR) has been identified as a community input variable. This variable, often referred to in Kentucky as "Holding Power", is affected by both students' drop out rates and migration in and out of the community. Both of these are factors over which the schools have little control.

Holding Power, as can be seen in Table 22, was found to be significantly related to student performance in eleven of the twelve analyses reported in this study. The only instance in which HLD PWR was not found to be significant was in the analysis of eleventh grade Citizenship scores. It is also of some interest to note that in those instances where HLD PWR did enter an eleventh grade analysis the standard error of the regression coefficient was too large to allow any conclusions about the directions of these relationships. However, when relating HLD PWR to student performance at the fourth and eighth grade levels where performance measures were available, the observed relationships were consistently negative. This is an indication that lower percentages of ninth graders graduating from high school are associated with higher levels of student performance.

TABLE 22: SUMMARY OF THE RELATIONSHIPS BETWEEN PERCENT OF NINTH GRADERS GRADUATING FROM HIGH SCHOOL AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	-	-	*
Human Relationships	///	-	*
Citizenship	///	-	NE
Creative, Constructive, and Critical Thinking	///	-	*
Occupational Competence	///	-	///
Cultural Appreciation	///	-	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

These observed negative relationships between HLD PWR and student performance are somewhat difficult to understand. One would hope to find that higher rates of holding power would indicate higher levels of performance. However, the empirical data do not support such hypothesized relationships. The question that now must be answered is concerned with determining what is causing higher levels performance in the elementary and junior high grades where holding power rates are relatively low. This question must be addressed before the negative relationships just discussed can really be evaluated. If it were found for example that a single factor were causing both high performances and low holding power, an attempt to increase performance by altering this factor would at the same time have the affect of reducing the percent of ninth graders graduating from high school. On the other hand, if it were found that HLD PWR and performance were caused by separate factors, the possibility of transferring or altering that factor which caused higher performance to raise performance levels in those districts with low holding power rates should definitely be investigated.

RANK 2: The percent of a district's professional staff certified Rank 2 or higher has been identified in this study as a school process variable. This is a variable over which the local school district can exercise some control although factors such as financial considerations can limit this control. Districts can still take certain steps which would encourage teachers to seek higher levels of certification.

The percent of professional staff certified Rank 2 and above (RANK 2) entered all twelve of the analyses of student performance as can be seen in Table 23.

TABLE 23: SUMMARY OF THE RELATIONSHIPS BETWEEN THE PERCENT OF TEACHERS CERTIFIED RANK 2 AND ABOVE AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	*	+	*
Human Relationships	///	*	*
Citizenship	///	+	*
Creative, Constructive, and Critical Thinking	///	*	+
Occupational Competence	///	+	///
Cultural Appreciation	///	*	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

However, in only four of these instances was it possible to make any statements about the direction of these relationships; eighth grade General Education, Citizenship, and Occupational Competence scores, and eleventh grade Creative, Constructive, and Critical Thinking scores. In all four of these cases, the relationships were positive, indicating that higher percentages of staff certified Rank 2 and above were associated with higher levels of student performance in the four analyses previously mentioned.

RANK 4: The percent of a local district's staff certified Rank 4 has been defined as a school process variable. Rank 4 certification is an emergency certification. Although a number of intervening factors outside a school's control may force the employment of this type of personnel, it would also seem that in a number of cases such concerns as immediate convenience and financial priority also enter such decisions. Because educators can exercise at least some control over these decisions, RANK 4 has been defined as a school process variable.

TABLE 24: SUMMARY OF THE RELATIONSHIPS BETWEEN THE PERCENT OF STAFF CERTIFIED RANK 4 AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	+	*	+
Human Relationships	///	+	+
Citizenship	///	*	+
Creative, Constructive, and Critical Thinking	///	+	+
Occupational Competence	///	*	///
Cultural Appreciation	///	+	+

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

RANK 4 entered all twelve analyses of student performance. In only three of these analyses was the associated standard error of the regression coefficient too large to draw any conclusions about the direction of the relationships. These were all at the eighth grade level; General Education, Citizenship, and Occupational Competence.

In all other cases, the relationships between the percent of staff certified Rank 4 and measures of student performance are in a positive direction. This is not the kind of relationships which would most likely have been hypothesized in the absence of any empirical data. One would have expected higher percentages of Rank 4 staff to have been associated with lower levels of student

performance. This kind of a relationship would have been evidenced by a negative relationship.

The above kinds of findings should encourage further investigations into the relationships between student performance and teacher certification. Such investigations should focus on identifying "intervening" factors which might be related to both certification patterns and levels of student performance.

However, the possibility that Rank 4 teachers possess some attribute as a group which enhances their effectiveness as teachers cannot be overlooked. The identification of such an attribute would have implications for the improvement of our teacher education programs, teacher certification, or both.

PUP TH: Pupil/teacher ratio has been identified for purposes of this study as a school process variable. Of course, it is recognized that all districts have certain limits on how large a staff can be hired. However, a local district does have some control over the proportion of the staff which are classroom teachers, administrative staff, and other supportive personnel. A district also has some options in directing funds to either material or staff needs.

TABLE 25: SUMMARY OF THE RELATIONSHIPS BETWEEN PUPIL/TEACHER RATIO AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	*	*	*
Human Relationships	///	*	*
Citizenship	///	*	-
Creative, Constructive, and Critical Thinking	///	*	NE
Occupational Competence	///	*	///
Cultural Appreciation	///	*	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Pupil/teacher ratio (PUP TH) was entered into eleven of the twelve analyses of student performance. As can be seen in Table 25, PUP TH did not enter into the analysis of eleventh grade Creative, Constructive, and Critical Thinking scores. One would expect that when PUP TH was entered into an analysis that the relationship would be negative. Lower pupil/teacher ratios would be expected to be associated with higher levels of student performance. However, this expected pattern of relationships was confirmed in only one of

the eleven instances where PUP TH entered the analyses, the analysis of eleventh grade citizenship scores.

PUP GD: The pupil/guidance counselor ratio has also been defined as a school process variable. Although fiscal restraints place certain limits on a district's options, a district's priorities would be a more important factor in determining the number of guidance counselors employed. As can be seen in Table 26, PUP GD was entered into all twelve analyses of student performance and therefore can be considered to be related to performance in each goal area at each of the three grade levels where measures of performance were available.

Low pupil/guidance counselor ratios would be expected to be associated with higher levels of student performance as would be evidenced by negative relationships with student performance. In seven of the twelve analyses summarized in Table 26, this expected negative relationship was empirically confirmed. Six of the seven negative relationships found were at the eighth grade level. It should be noted that the data did not reveal any positive relationships between PUP GD and student performance.

TABLE 26: SUMMARY OF THE RELATIONSHIPS BETWEEN PUPIL/ GUIDANCE COUNSELOR RATIO AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	*	-	-
Human Relationships	///	-	*
Citizenship	///	-	*
Creative, Constructive, and Critical Thinking	///	-	*
Occupational Competence	///	-	///
Cultural Appreciation	///	-	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

TH EXP: Teacher experience has been defined in this study as being a school process variable. The intent was not to totally discount the impact of certain community factors such as a community's geographic location, or its ability or willingness to pay teachers. However, there are still several factors that would seem to contribute to a district's being able to hold teachers already in the system which would seem to be under a district's control. Some of these factors would be the working environment, promotion practices, and financial priorities.

TABLE 27: SUMMARY OF THE RELATIONSHIPS BETWEEN TEACHER EXPERIENCE AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	+	+	+
Human Relationships	///	*	*
Citizenship	///	*	+
Creative, Constructive, and Critical Thinking	///	*	+
Occupational Competence	///	+	///
Cultural Appreciation	///	*	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Teacher experience (TH EXP) was entered into all twelve analyses of student performance as can be seen in Table 27. One would expect TH EXP to be positively associated with student performance. In the six instances where the standard error of regression coefficients were not too large, positive relationships were found between TH EXP and student performances.

ATTEND: The percent of students in average daily attendance (ATTEND) has been defined in this study as a school process variable. Some care must be taken not to confuse ATTEND with "average daily attendance" (ADA), an indication of school size as discussed earlier. Although certain community and social factors can certainly affect the attendance rate within a district, the school still has a major responsibility in the area of enforcing the school attendance laws.

TABLE 28: SUMMARY OF THE RELATIONSHIPS BETWEEN THE PERCENT OF STUDENTS IN AVERAGE DAILY ATTENDANCE AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	+	+	+
Human Relationships	///	+	+
Citizenship	///	*	+
Creative, Constructive, and Critical Thinking	///	+	+
Occupational Competence	///	*	///
Cultural Appreciation	///	*	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Percent of students in average daily attendance was entered into all twelve analyses of student performance as can be seen in Table 28. High attendance rates would be expected to be associated with high levels of student performance as would be evidenced by positive relationships. In all eight instances where the standard error of the regression coefficient was small enough to allow for any conclusions about the direction of the relationship, they were found to be positive. Thus, the empirical data gathered for this study would seem to support the expected relationship between ATTEND and student performance.

PUP AD: Pupil/administrator ratio has been defined in this study as a school process variable. For the most part, schools would seem to have control over the number of administrative positions established and their respective functions.

TABLE 29: SUMMARY OF THE RELATIONSHIPS BETWEEN PUPIL/ ADMINISTRATOR RATIOS AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	+	NE	*
Human Relationships	///	+	*
Citizenship	///	+	*
Creative, Constructive, and Critical Thinking	///	+	*
Occupational Competence	///	+	///
Cultural Appreciation	///	+	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Pupil/administrator ratio entered eleven of the analyses of student performance as is reported in Table 29. The only instance in which PUP AD was not significantly related to student performance was in the analysis of eighth grade General Education. In six of the eleven instances where PUP AD did enter the analyses was the standard error of the regression coefficients were relatively small. In all six of these instances, the relationships were positive indicating that higher pupil/administrator ratios were associated with higher levels of student performance.

PUP PR: Pupil/principal ratio has been defined for purposes of this study as a school process variable. Again, it would seem that the local district would have the power to alter this variable considerably when staffing priorities are considered.

TABLE 30: SUMMARY OF THE RELATIONSHIPS BETWEEN PUPIL/ PRINCIPAL RATIOS AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	*	*	*
Human Relationships	///	-	+
Citizenship	///	-	+
Creative, Constructive, and Critical Thinking	///	-	+
Occupational Competence	///	+	///
Cultural Appreciation	///	-	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

Pupil/principal ratio was entered into all twelve analyses of student performance as can be seen in Table 30. Due to the relatively large standard error of regression coefficients, it was not possible to detect the direction of the relationships between PUP PR and General Education at any of the three grade levels, or between PUP PR and eleventh grade Cultural Appreciation. It is interesting to note that with the exception of the analysis of eighth grade occupational competence where the direction of the relationship was detectable, the relationship was negative at the eighth grade level while all such relationships at the eleventh grade level were positive. Further investigation into these kinds of differences might provide some insight into the different levels of supervision needed at the junior high level as opposed to the senior high level.

TH SUP: Teacher/instructional supervisor ratio has been defined for purposes of this study as a school process variable, one over which the school has primary control. As can be observed in Table 31, teacher/instructional supervisor ratio (TH SUP) entered all twelve analyses of student performance. In those cases where the standard error of the regression coefficient was not excessively large, an interesting pattern of relationships has appeared. In all cases at the eleventh grade level, with the exception of the analysis of General Education, the relationships were in a positive direction indicating that higher teacher/supervisor ratios are associated with higher levels of student performance.

At the eighth grade level in the four cases where it was possible to make a statement about direction, TH SUP was found to be negatively related to student performance. Again, in the analysis of fourth grade General Education, the relationship was positive.

TABLE 31: SUMMARY OF THE RELATIONSHIPS BETWEEN TEACHER/ INSTRUCTIONAL SUPERVISOR RATIOS AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	+	-	*
Human Relationships	///	*	+
Citizenship	///	-	+
Creative, Constructive, and Critical Thinking	///	-	+
Occupational Competence	///	-	///
Cultural Appreciation	///	*	+

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

PRG UTS: The number of program units offered at the high school level has been defined as a school process variable for purposes of this study. Within certain limits as affected by financial restraints and numbers of students within a district, the school district can alter this variable. As can be observed in Table 32, program units offered was entered into ten of the twelve analyses of student performance. It was not found to be a significant variable in the analysis of student performance in eleventh grade Human Relationships and eleventh grade Creative, Constructive, and Critical Thinking. In only two cases were there regression coefficients with associated standard errors small enough to allow any conclusions about the direction of the relationships with student performance; these two cases involved General Education and Human Relationships both at the eighth grade level. Both were found to be negative as reported in Table 32.

TABLE 32: SUMMARY OF THE RELATIONSHIPS BETWEEN PROGRAM UNITS AT THE HIGH SCHOOL LEVEL AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	*	-	*
Human Relationships	///	-	NE
Citizenship	///	*	*
Creative, Constructive, and Critical Thinking	///	*	NE
Occupational Competence	///	*	///
Cultural Appreciation	///	*	*

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

PUP LIB: Pupil/librarian ratio has been defined as a school process variable, a variable over which the school has some control. As can be seen in Table 33, pupil/librarian ratio was entered into all twelve analyses of student performance. However, in only three of these cases were conditions such that conclusions about the direction of these relationships could be drawn. In two of these instances, fourth and eighth grade General Education, the relationship was found to be negative indicating an association between higher levels of student performance and lower pupil/librarian ratios. This is, of course, the kind of relationship that would intuitively be expected. Only one exception to these expectations was observed. This was in the analysis of eighth grade cultural appreciation where the relationship was found to be positive.

TABLE 33: SUMMARY OF THE RELATIONSHIPS BETWEEN PUPIL/LIBRARIAN RATIOS AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	-	-	*
Human Relationships	///	*	*
Citizenship	///	*	*
Creative, Constructive, and Critical Thinking	///	*	*
Occupational Competence	///	*	///
Cultural Appreciation	///	+	*

* * * * *

TABLE 34: SUMMARY OF THE RELATIONSHIPS BETWEEN EXPULSION RATES AND STUDENT PERFORMANCE

	Grade 4	Grade 8	Grade 11
General Education	+	*	*
Human Realtionships	///	-	+
Citizenship	///	-	*
Creative, Constructive, and Critical Thinking	///	-	+
Occupational Competence	///	*	///
Cultural Appreciation	///	-	+

/// no measure of student performance
\+ positive relationship
\- negative relationship
* large standard error of regression coefficient
NE not entered in analysis

EXPL: Expulsion rate has been identified as a school process variable for purposes of this study. As can be seen in Table 34, Expulsion Rate ratio was also entered in all twelve analyses of student performance. Intuitively, one would expect that expulsion rates and student performance would be negatively related. Low expulsion rates should indicate high levels of performance. In four of the eight instances where it was possible to draw conclusions about the direction of the relationships, negative relationships as would have been expected were found. But in the other four such instances, the data revealed positive relationships. It is of some interest to note that those negative relationships observed, all were at the eighth grade level. At the same time, the three relationships at the eleventh grade level about which some conclusions concerning direction could be made were all of a positive nature.

Quality Rankings: Quality Ranking is a term used throughout this study which has been defined as "over-all student performance." In the section "Quality Rankings Analyses," analyses comparing the highest thirty districts in terms of over-all student performance and the lowest thirty districts at both the eighth and eleventh grades were reported. Table 35 briefly summarizes these analyses by listing the first five variables in order of importance in discriminating between the higher and lower performing districts at the two respective grade levels. For a more complete summary of these analyses, Tables 16B through 16F should be consulted.

TABLE 35: FIVE MOST IMPORTANT VARIABLES IN DISCRIMINATING BETWEEN HIGHER PERFORMING AND LOWER PERFORMING DISTRICTS

Step Entered	Grade 8	Grade 11
1	HLD PWR	ATTEND
2	PUP GD	RANK 4
3	EXPL	PUP PR
4	PUP AD	TH SUP
5	ADA	EXPL

The first five variables in order of importance in discriminating between higher and lower performance districts at the eighth grade level differ considerably from those found at the eleventh grade level. The only variable which appears in the first five variables at both grade levels was the expulsion rate (EXPL).

Conclusions: The research that has been summarized in this report must be classified as "descriptive" in nature. The relationships between the identified independent variables for this study and student performance which have been summarized earlier in this section, "Summary and Conclusions," are points on which educators wishing to increase student performance can focus attention. One should not conclude that altering one of these variables discussed in this report would necessarily cause the desired change in student performance. It is possible that a factor, or factors, that we are not presently able to observe is affecting both student performance and the independent variable of interest.

For example, as was reported in Table 28, percent of students in average daily attendance was related to student performance in General Education in a positive direction at all three grade levels with which this study has concerned itself. Although it is possible that by raising attendance rates student performance in General Education would also be raised, it may also be possible that some social or economic factor not included in this study causes both high attendance rates and high student performance. A high value placed on education in the home might encourage both high performance and high attendance rates, while the absence of this value might result in the opposite.

In considering these possibilities, one should not disregard the importance of the consistent relationship reported in Table 28. If this relationship does not provide the key to raising student performance in General Education, it does provide a clue as to which directions our efforts to this key should be directed.

APPENDIX A

GOALS OF EDUCATION IN KENTUCKY

1. General Education:	1.1 Skill in written and oral communication, reading, computation, and mathematical concepts
	1.2 Understanding the language common to the various learning disciplines
	1.3 Knowledge of logical approaches for problem solving
	1.4 Application of acquired skills to real-life situations
	1.5 Knowledge in the various learning disciplines (e.g. science, social science, foreign language, etc.)
	1.6 Understand the resources available and the methods of collecting information
	1.7 Positive attitude toward the acquisition of knowledge - both formal and informal
2. Economic Understanding:	2.1 Consumer Knowledge
	2.2 Information on tax structures and obligations
	2.3 An understanding of money management
	2.4 A knowledge of the American economic system in relation to international economics
	2.5 Demonstrate economic independence
3. Human Relationships:	3.1 Knowledge of one's self in relation to capabilities and interests
	3.2 Understanding the worth and dignity of other people
	3.3 Ability to work with and relate to other individuals and groups
	3.4 Appreciation of our culture and those attributes which have enabled man to survive and accomplish

4. Citizenship:	4.1 Understanding the necessity for structured social and political organization
	4.2 Understanding the necessity for ethical values in determining right from wrong
	4.3 Knowledge of the interdependence of the individual's rights and responsibilities in a democracy
	4.4 Awareness of one's relationship to his physical environment and the wise use of resources
	4.5 Understanding the effects of technology and of population growth on the environment
	4.6 Attitude of cooperation for the betterment of one's community and society
	4.7 Understanding the relationship of historical occurrences to present and future planning
	4.8 Knowledge of international relationships
	4.9 Awareness of the importance of involvement in community affairs
5. Creative, Constructive, and Critical Thinking:	5.1 Ability to examine constructively and creatively
	5.2 Development of individual creative talents
	5.3 Respect for creative contributions of others
	5.4 Application of the logical processes (e.g. research, analysis, evaluation, etc.)
	5.5 Critical awareness of the less obvious qualities or conditions which contribute to total understanding
6. Physical and Mental Well Being:	6.1 Develop physical fitness through appropriate activities
	6.2 Understanding of the body processes and functions
	6.3 A positive and realistic acceptance of self

	6.4 Development of skills for and appreciation of leisure time activities
	6.5 Understanding and value for good nutritional habits
7. Occupational Competence:	7.1 Understanding the contributions of occupations to society
	7.2 Understanding of the variety of career opportunities
	7.3 Acquisition of occupational skills (entry and maintenance skills)
	7.4 Ability to cope with changing occupational requirements and demands
8. Cultural Appreciation:	8.1 Acquisition of knowledge of art, musical, literary and drama forms
	8.2 Understanding of and value for the historical and cultural heritage
	8.3 Development of aesthetic values
	8.4 Expression of cultural values

TABLE A1

MEANS AND STANDARD DEVIATIONS BY GRADE LEVEL

	Grade 4		Grade 8		Grade 11	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
GEN ED	50.00	10.00	50.00	10.00	50.00	10.00
HUM REL	-	-	50.00	10.00	50.00	10.00
CITIZ	-	-	50.00	10.00	50.00	10.00
CCCT	-	-	50.00	10.00	50.00	10.00
OCU CMP	-	-	50.00	10.00	-	-
CULL AP	-	-	50.00	10.00	50.00	10.00
RANK 2	34.73	8.99	34.83	8.06	36.02	8.87
RANK 4	.16	.42	.19	.45	.20	.48
PUP TH	22.99	2.03	22.85	2.08	22.96	1.93
PUP GD	1327.12	687.38	1326.53	721.72	1275.17	638.57
TH EXP	10.30	2.12	10.39	2.30	10.33	2.24
ATTEND	93.56	1.17	93.63	1.19	93.57	1.20
PUP AD	315.37	82.36	308.60	76.02	319.79	81.48
PUP PR	507.82	189.87	490.14	163.05	491.38	136.23
TH SUP	108.23	46.69	106.50	47.51	104.48	47.82
PRG UT	87.24	156.99	82.02	164.80	87.64	170.81
PUP LIB	666.92	424.48	649.06	412.33	611.72	287.49
EXPL	.22	.74	.26	.80	.17	.30
EC DEP	32.51	18.83	33.52	18.01	33.75	18.76
DELINQ	45.85	56.89	43.28	52.34	47.65	57.27
INCOME	3631.72	817.68	3617.36	789.54	3620.25	782.46
DRP OTS	2.11	1.33	2.02	1.33	2.12	1.38
ADA	3811.82	8564.89	3610.65	9158.13	3822.26	9492.95
HLD PWR	64.66	15.51	65.70	14.77	67.32	11.73

TABLE A2

ZERO ORDER CORRELATION COEFFICIENTS OF CRITERION VARIABLE WITH INDEPENDENT SCHOOL PROCESS AND COMMUNITY INPUT VARIABLES AT THE FOURTH GRADE LEVEL

	GEN ED	
RANK 2	.251	
RANK 4	.029	
PUP TH	-.132	
PUP GD	-.055	
TH EXP	.000	
ATTEND	.359	
PUP AD	.194	
PUP PR	-.028	
TH SUP	.130	
PRG UT	.101	
PUP LIB	-.105	
EXPL	-.095	
EC DEP	-.484	
DELINQ	.056	
INCOME	.298	
DRP OTS	-.317	
ADA	.104	
HOLD PWR	.164	

TABLE A3

ZERO ORDER CORRELATION OF COEFFICIENTS OF CRITERION VARIABLES WITH INDEPENDENT SCHOOL PROCESS AND COMMUNITY INPUT VARIABLES AT THE EIGHTH GRADE LEVEL

	GEN ED	HUM REL	CITIZ	CCCT	OCU CMP	CUL AP
RANK 2	.221	-.026	.133	.080	.232	-.120
RANK 4	-.044	.126	.028	.086	.021	.147
PUP TH	.085	.214	.137	.158	-.040	.169
PUP GD	-.174	-.121	-.079	-.130	-.179	-.087
TH EXP	-.098	.145	.040	.098	.104	.193
ATTEND	.408	.036	.095	.236	.249	-.037
PUP AD	.074	.139	.180	.172	.020	.059
PUP PR	.028	.054	-.055	.073	-.211	.136
TH SUP	-.060	-.039	-.068	-.059	-.171	-.031
PRG UT	.082	-.104	-.150	-.037	.072	-.131
PUP LIB	.038	.094	.055	.121	-.107	.147
EXPL	-.123	-.216	-.178	-.270	-.043	-.139
EC DEP	-.451	.079	-.069	-.179	-.169	.227
DELINQ	.135	-.107	-.108	-.079	-.019	-.109
INCOME	.358	-.088	.084	.053	.212	-.184
DRP OTS	-.145	.154	.057	.010	-.142	.159
ADA	.087	-.099	-.055	-.039	.067	-.124
HLD PWR	.012	-.282	-.193	-.153	.032	-.385

TABLE A4

ZERO ORDER CORRELATION COEFFICIENTS OF CRITERION VARIABLES WITH INDEPENDENT SCHOOL PROCESS AND COMMUNITY INPUT VARIABLES AT THE ELEVENTH GRADE LEVEL

	GEN ED	HUM REL	CITIZ	CCCT	CUL AP
RANK 2	.247	.100	.063	.206	.029
RANK 4	.046	.103	.144	.127	.152
PUP TH	.058	-.082	-.216	-.107	-.012
PUP GD	-.190	-.078	-.059	-.089	-.033
TH EXP	-.091	.063	.007	-.062	.147
ATTEND	.425	.122	.169	.267	-.024
PUP AD	.129	.052	.115	.137	.030
PUP PR	.076	.130	.115	.118	.112
TH SUP	-.189	.070	.064	.078	.126
PRG UT	.1.1	-.028	.065	.038	-.056
PUP LIB	.006	-.067	-.028	-.045	.021
EXPL	-.142	.121	-.020	.014	.161
EC DEP	-.479	-.014	-.059	-.270	.088
DELINQ	.097	.130	.156	.206	-.036
INCOME	.305	-.016	.167	.208	-.137
DRP OTS	-.250	.007	-.013	-.164	.076
ADA	.102	-.029	.052	.031	-.055
HLD PWR	.268	.080	.115	.258	-.040